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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,857	05/31/2001	Ralf Trutschel	10191/1750	3474

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EXAMINER

KIM, CHRISTOPHER S

ART UNIT

PAPER NUMBER

3752

DATE MAILED: 01/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/763,857

Applicant(s)

TRUTSCHEL ET AL.

Examiner

Christopher S. Kim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The preliminary amendment filed on May 31, 2001 has been entered.
2. Amendment filed November 13, 2002 is acknowledged.
3. Applicant's statement regarding typographical error in claim numbering 11-21 (understood by the applicant to be 12-22) is acknowledged. The examiner utilized applicant's original numbering without indicating as such. Claim numbering in this action reflects the renumbering of the claims.
4. This Office action utilizes line numbers, which includes numbering of blank lines, provided by the applicant when referring to lines in the specification section of the application by line number.
5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Drawings

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "direct injection of a fuel into a combustion chamber of the internal combustion engine" recited in claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

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A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

7. Claim 12 is objected to because of the following informalities: claim 12 does not seem to accurately reflect the marked-up version. Lines 17-18 recite "the outlet orifice" whereas the marked-up version indicates "an outlet orifice". This Office action considers "an outlet orifice" as indicated by the marked-up version. Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. Claim 19 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "a spray element" in line 2. This appears to be a double inclusion of the "valve seat element" recited in claim 11, line 6. The specification, on page 8, line 27, discloses "valve seat element 26 is divided again downstream from the valve face 27. It appears that, although the spray element is designated by reference 67, it appears that the spray element is a sub element of the valve seat element.

Claim Rejections - 35 USC § 103

9. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (4,890,794) in view of Shen et al. (5,878,962).

With respect to claims 12, 13 and 15-22, Imafuku et al. discloses a fuel injector comprising: an energizable actuating element 14; a valve needle 27; a fixed valve seat 48; a valve seat element 9, 55; an orifice 54a,b; a valve closing section 47; a flattened face (downstream end of 45); an outlet orifice (outlet of orifice 54a,b). Imafuku et al. does not disclose a swirl-producing element. Shen et al. discloses a swirl-producing element 38, 48 upstream of a fixed valve seat 34. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have incorporated the swirl-producing element of Shen et al. to the device of Imafuku et al. to provide a swirl pattern spray.

With respect to claim 14, Imafuku et al. in view of Shen et al. discloses the limitations of the claimed invention with the exception of the ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to d/D of approximately 1.5 for optimization dependent of operating criteria, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

10. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. (5,996,912).

Ren et al. differs from what is being claimed in the flattened face diameter d being greater than the outlet orifice diameter. Ren et al. discloses an outlet orifice

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diameter d_0 which is greater than the flattened face diameter d_f . This embodiment is precisely the embodiment applicant discloses in figure 6 and on page 9, lines 8-13 of the current application. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have optimized the values of d_0 and d_f for desirability dependent on certain applications (applicant's specification, page 9, line 12).

Response to Arguments

11. Applicant's arguments filed November 13, 2002 have been fully considered but they are not persuasive.

In response to applicant's argument that the drawings fully comply with the requirements of 37 C.F.R. 1.83, the "drawings must show every feature of the invention specified in the claims." The drawings fails to show "direct injection of fuel into the combustion chamber of an internal combustion engine."

In response to applicant's argument directed to the combination of Imafuku et al. and Shen et al., applicant's arguments are not commensurate in scope with the claimed invention. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that Ren et al. teaches away from the claimed invention, applicant's arguments are not commensurate in scope with the

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claimed invention. Additionally, applicant discloses, in the specification, page 9, lines 8-13, that the same can be accomplished with $d < D$. It appears that $d > D$ or $d < D$ has no criticality.

In response to applicant's argument starting on page 6, line 31, of the response to page 8, line 7, Shen et al. is applied as a secondary reference for the teachings a swirl-producing element.

In response to applicant's argument that the prior art fails to disclose the claimed invention, applicant asserts a blanket statement and fails to identify the undisclosed elements in the prior art.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Shen et al. provides the motivation in column 3, lines 1-5. "it is a primary object of the present invention to provide a novel and improved fuel injector for directing a conical swirling spray pattern of fuel to an optimum location..." Regarding Ren et al., as indicated above, it appears from applicant's disclosure that $d > D$ or $d < D$ has no criticality. Therefore it is within the knowledge generally available to one of ordinary skill in the art to optimize the value of d for desirability dependent on application criteria.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher S. Kim whose telephone number is (703) 308-8336. The examiner can normally be reached on Monday - Thursday, 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mar can be reached on (703) 308-2087. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7766 for regular communications and (703) 308-7766 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

CK
January 16, 2003


MICHAEL MAR 1-20-03
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700